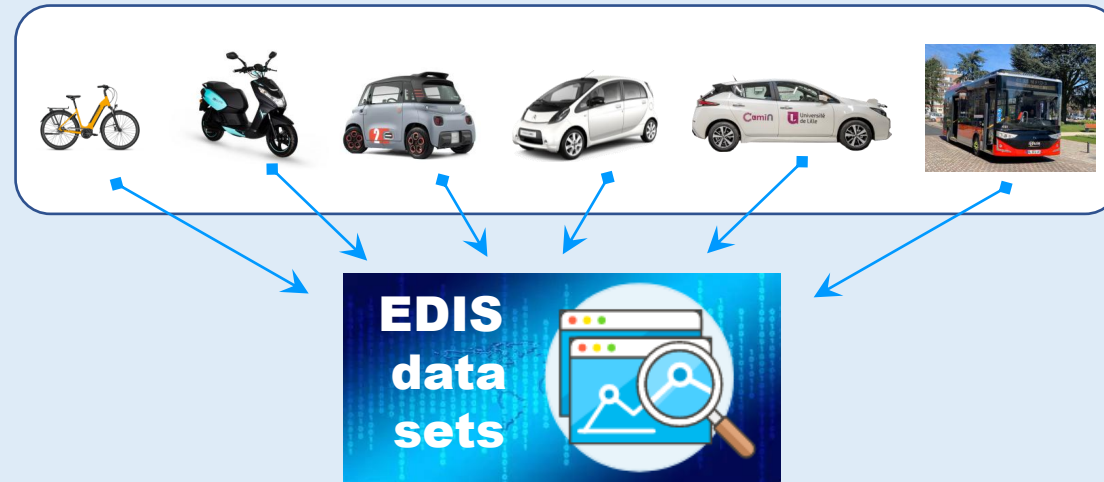


EDIS

Electro-mobility Data for Interdisciplinary Studies

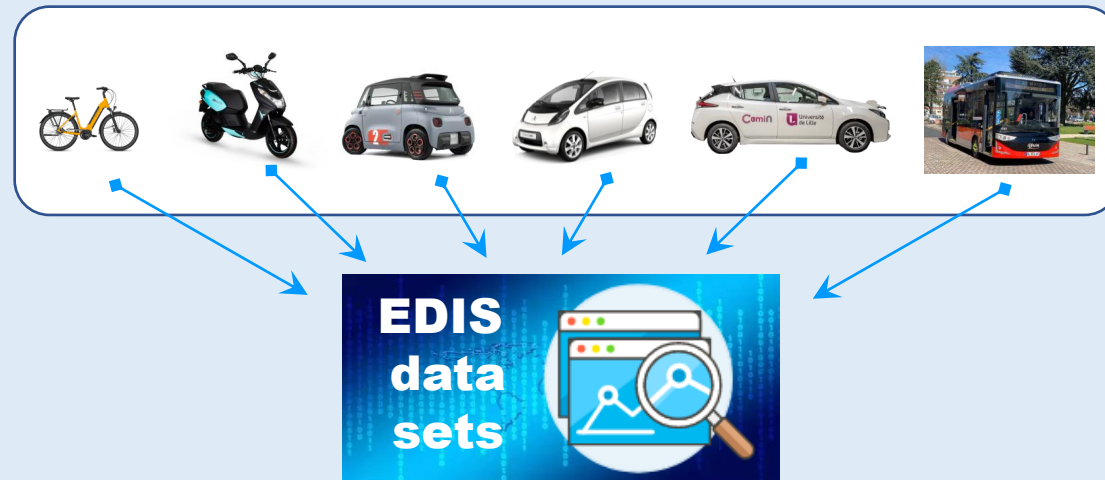


Ce travail a bénéficié d'une aide de l'Etat gérée par l'Agence Nationale de la recherche au titre de France 2030 portant la référence « ANR-24-PEMO-0002 »

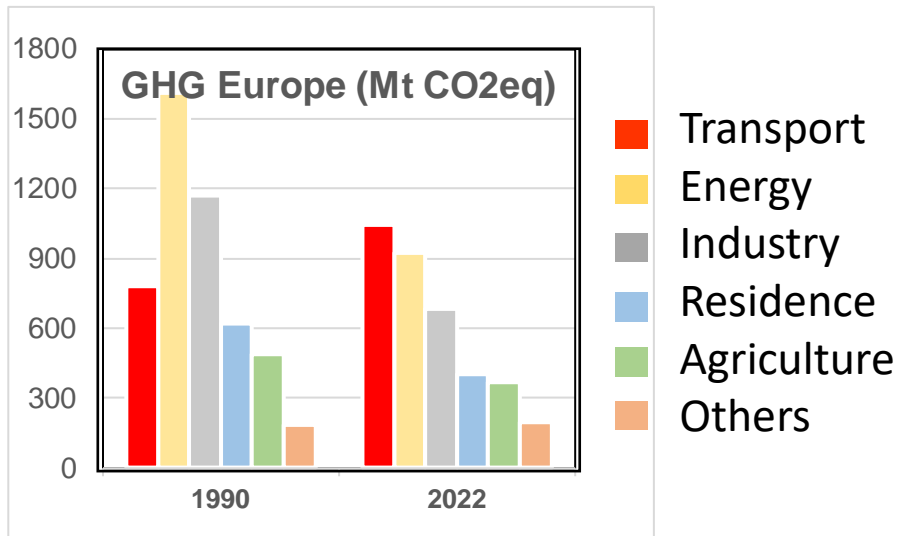
Outline

1. Context and Objective
2. Background
3. Global organisation

1. Context and Objective



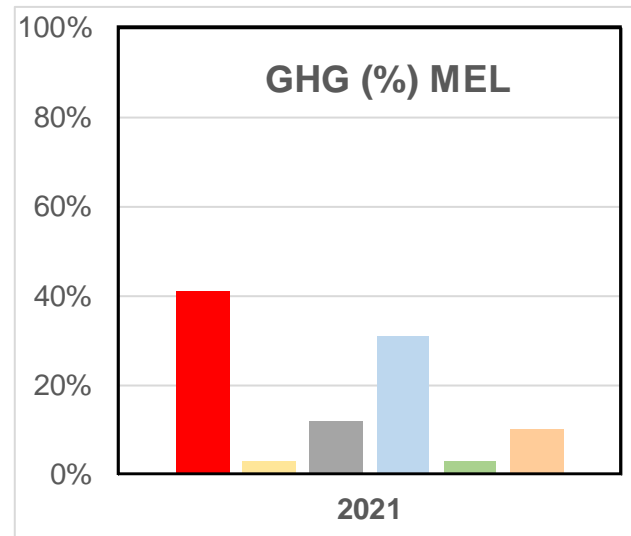
Mobility carbon footprint



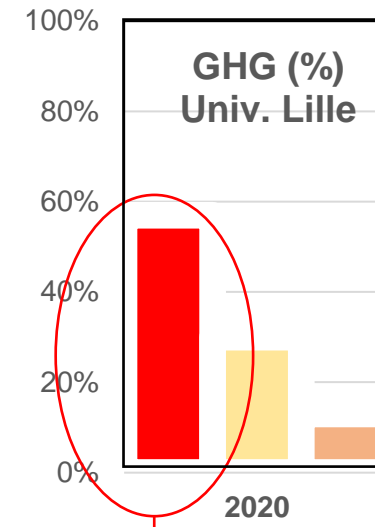
Transport, only sector still increasing [EEA 2023]



needs of low-carbon mobility



GHG in 2020
52 000 tons CO2eq



74 000 students
7 000 staff members

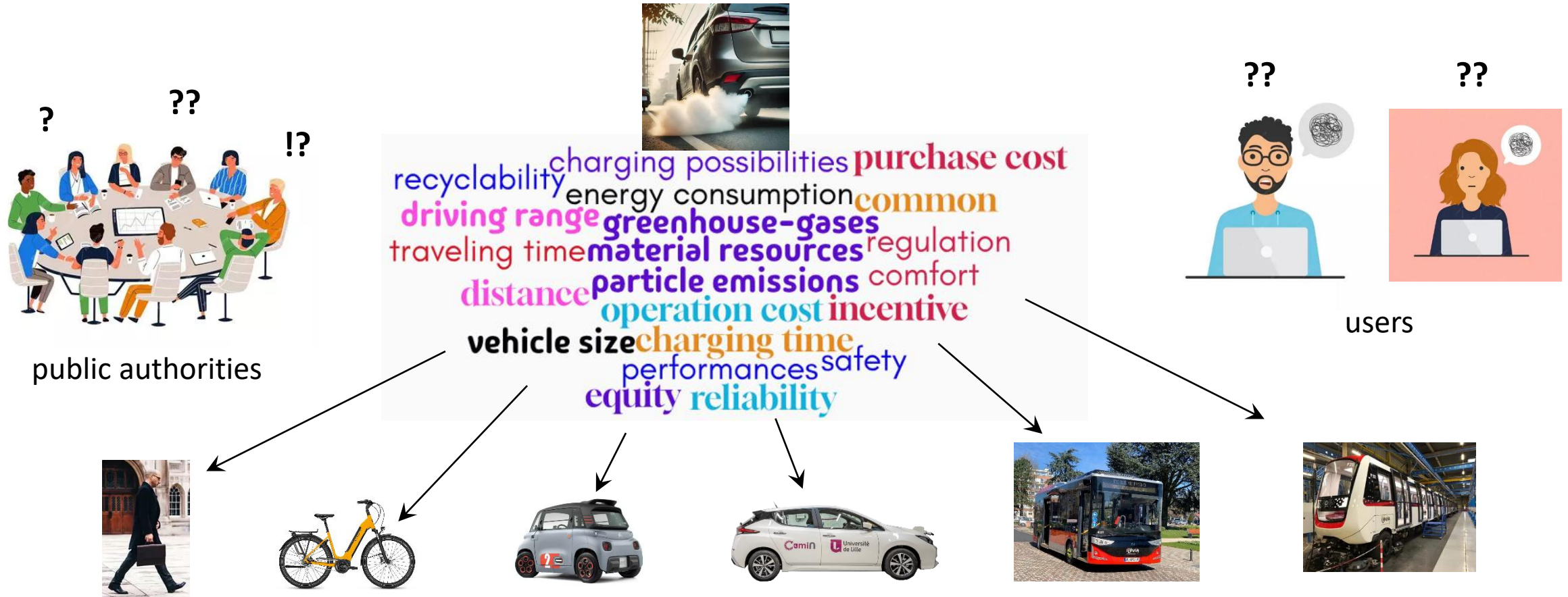
Thermal vehicles

- 24% of the trips
- 81% of the GHG



Impact of thermal vehicles

Complexity of the mobility transition



EDIS Objective

MOBIDEC “lack of mobility data for development of relevant decision-making policies”
(...) especially on e-mobility” [MOBIDEC 2024]

**EDIS: collection and publication of ST & SHS datasets on various types of e-vehicles
and their charging points**



Not only e-car !

How to collect relevant multidisciplinary data?

How to publish FAIRly e-mobility datasets for Open Sciences?



Decision-making is not a part of EDIS

Scientific Research Questions

- e-mobility is a relatively new mobility
- usages and perceptions are not yet well established
- average data are not relevant vs. the diversity of usages



challenge of
a common
framework

Heterogenous data



challenge on
Open Data Science

*Data management and
visualization*

Indicators (**to be defined**):

- Environmental (GHG...)
- Economical (TCO...)
- Social (charging time, barriers....)
- Technical (Energy, battery lifetime...)



MOBIDEC
"Data-factory"

Diversity of e-vehicles and charging points

Vehicle categories (EU)



E-bikes



e-motorbike



e-Quadricycles



e-compacts



e-sedans



e-Buses & coaches



A panel of e-vehicles and e-infrastructures
is being developed

EDIS Consortium



Field	Lab	Discipline
ST	L2EP	electrical engineering
	LICT-ECO7	
	LIRIS	computer sciences
	LIMOS	
MEL	transport engineering	
SHS	TVES	urbanism & geography
	CLERSE	socio-economics
	MODIS	psychology
	GERiico	Information & communication
	S2HEP	

Disciplines: 11 ST & 8 SHS

Gender: 9 F & 10 H

Lille / Lyon: 9 CUMIN & 10 G4M



EMob-Lab



MODIS

Gériico S2HEP



A balanced reliable consortium

EDIS impacts



Outputs
data collection method
e-mobility datasets

2030

Outcomes
debates and policies
mobility transition plans

Impact
contribution to
Net zero 2050

2050



e.g., mobility transition plans of
Univ. Lille and MEL

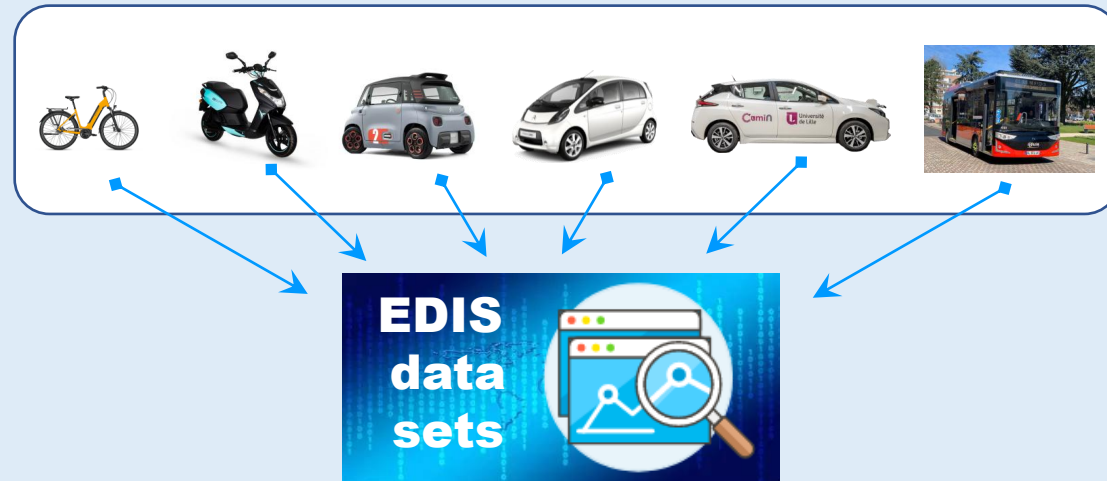


e.g., charging deployment
plans of UGE, ULyon



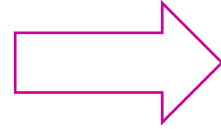
data for Axis - Tools for
Decision making

2. Background



CUMIN interdisciplinary programme

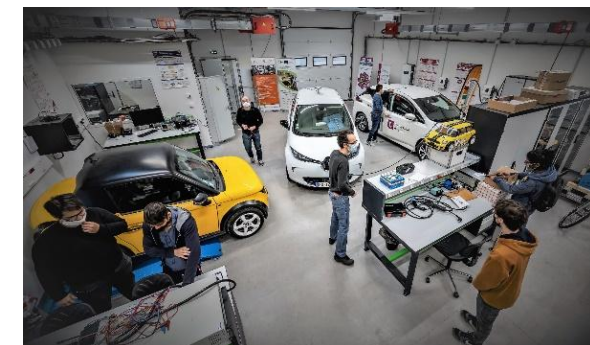
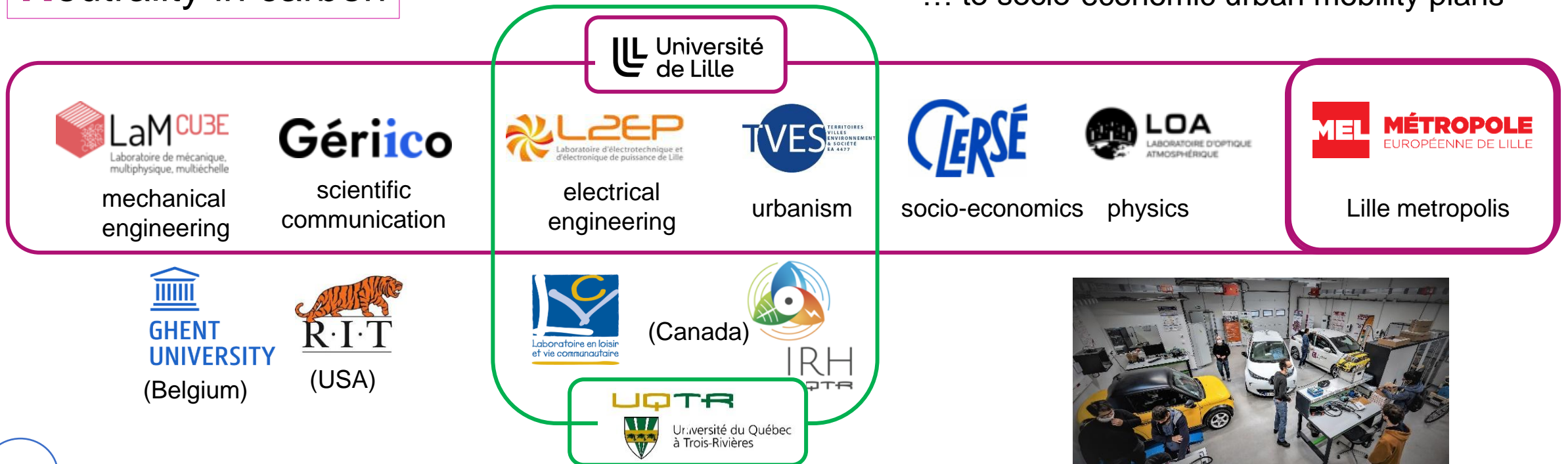
Campus of
University with
Mobility based on
Innovation and
Neutrality in carbon



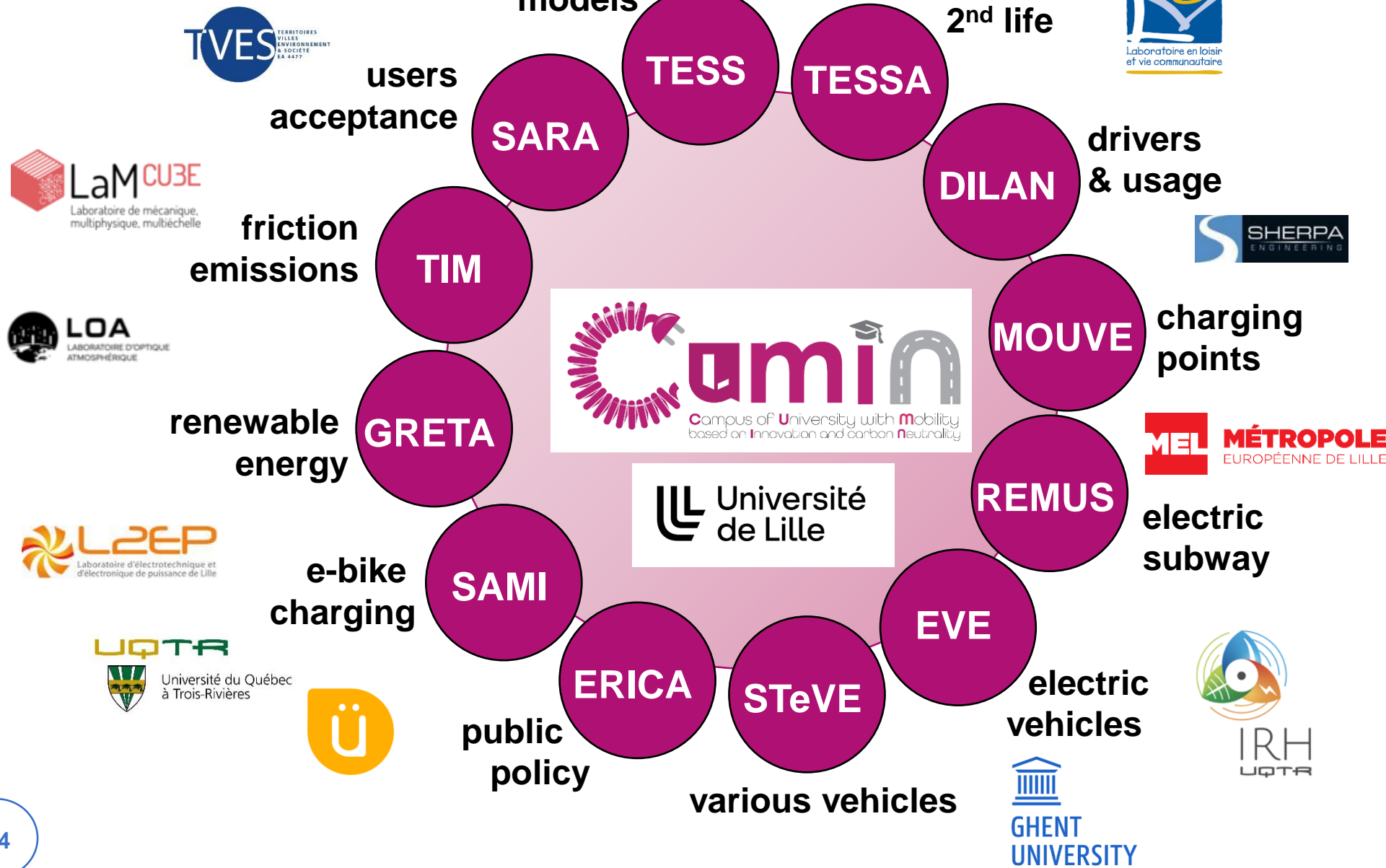
Development of interdisciplinary flexible methods and tools for e-mobility transition as an alternative to thermal cars with the campus « Cité Scientifique » as demonstrator

From innovative technical solutions....

... to socio-economic urban mobility plans



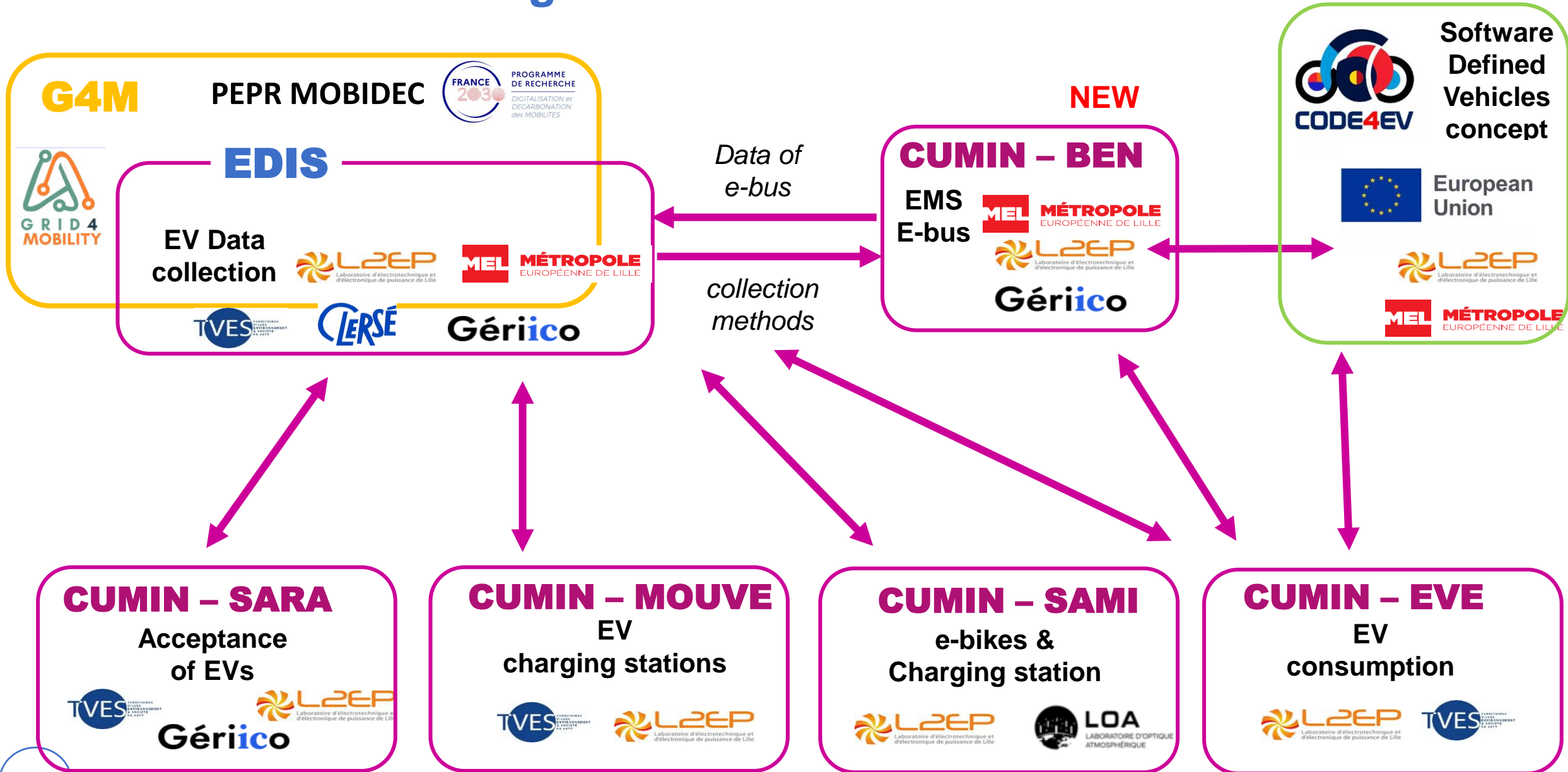
CUMIN portfolio



Funding

Supports

CUMIN as relevant background for EDIS



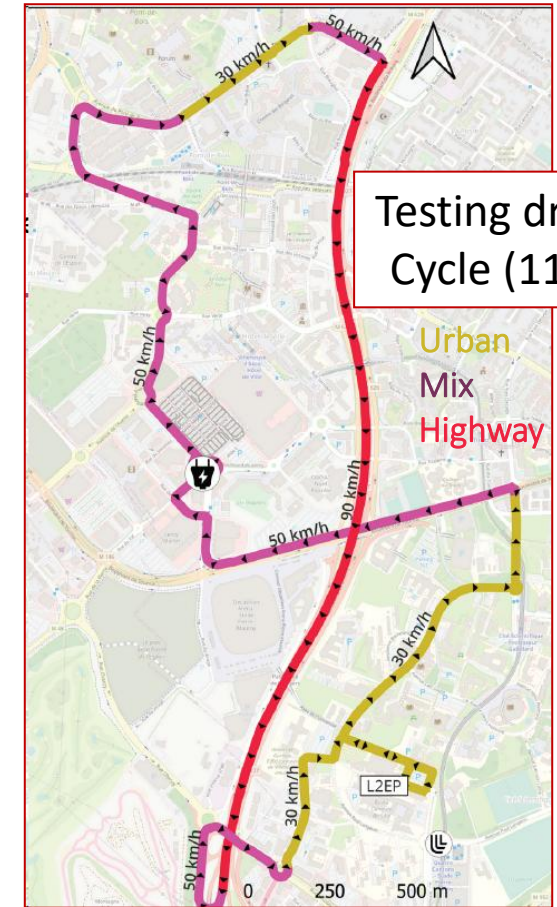
Example– CUMIN-SARA project



1. Survey on EV perception
2. Driving test
3. Survey on EV perception and commuting habits (1 SHS Eng. + 1 ST Eng.)

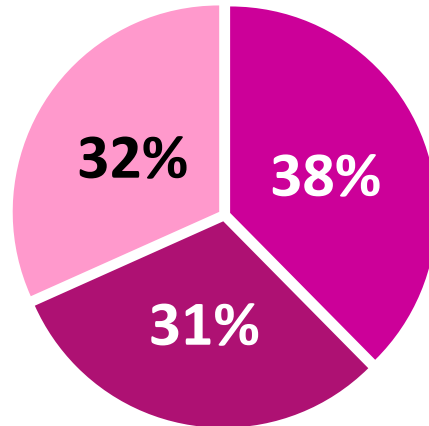


Gériico



Testing driving Cycle (11 km)

120 drivers
same vehicle
same trip
same period



- Above 45 years old
- 26-45
- Under 25 years old

Socio-behavioural aspects

- 82% in favor of adopting a HEV
- 51% with cost as their first issue
- 49% unaware of campus charging stations

Technical aspects

Variation in terms of energy consumption of 21%

Grid4Mobility: a partnership project



Toward a **management of energy** in smart grids including transport, building and renewable energy sources

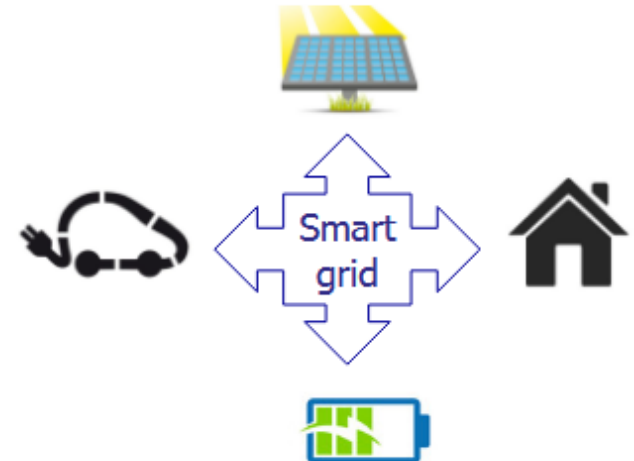
Shared and open experimental platform for an energy transition adapted to electromobility and buildings: from source to use...

Keywords

Systemic approach – real-life conditions

Interdisciplinarity

Open data - shared experiments



Grid4Mobility : 1 platform and 2 sites

“La Doua” (in Villeurbanne close to Lyon):

- University campus
- Diversity of buildings with real users
- Difficult to install prototypes and large experiments



“Transpolis” (40km from Lyon):

- Former military camp
- Secure site for prototypes (vehicles, energy set-up) or heavy vehicles



- Data from the 2 sites will be collected and merged in a unique virtual smart grid (a digital twin)
- Scenarios could be built and simulated with set-up from the 2 sites

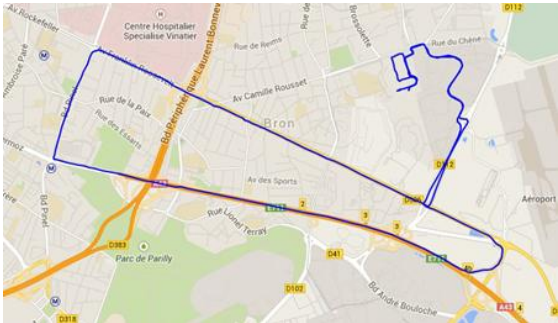
Protocole expérimental impliquant 100 conducteurs



- Participants sélectionnés à partir d'un questionnaire complété en ligne. Critères de sélection : + 2 ans de permis, jamais conduit de VE, conduit habituellement une voiture de gamme citadine
- Constitution de 3 groupes : consigne « neutre », « promotion », « prévention »
- Parcours : boucle de 12 km avec différentes situations de trafic
- Déroulement de la conduite :

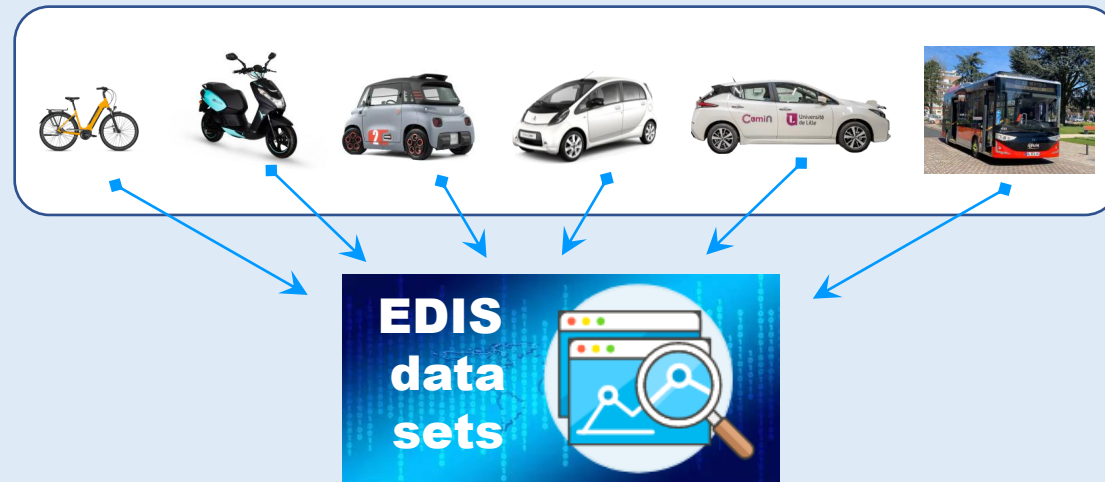
- Temps d'apprentissage en site fermé
- Premier parcours (**P1**) : sans indication
- Deuxième parcours (**P2**) : consigne « neutre » ou « promotion » ou « prévention »

Gain moyen P2/P1
Energie 9%




- Enregistrements des données mécaniques et électriques + questionnaires et entretiens
- Durée de l'expérimentation environ 2 heures

2. EDIS organisation



Scientific organization

MOBIDEC



FRANCE 2030
PROGRAMME DE RECHERCHE
DIGITALISATION et
DECARBONATION
des MOBILITES

Axis -
Mobility
Knowledge

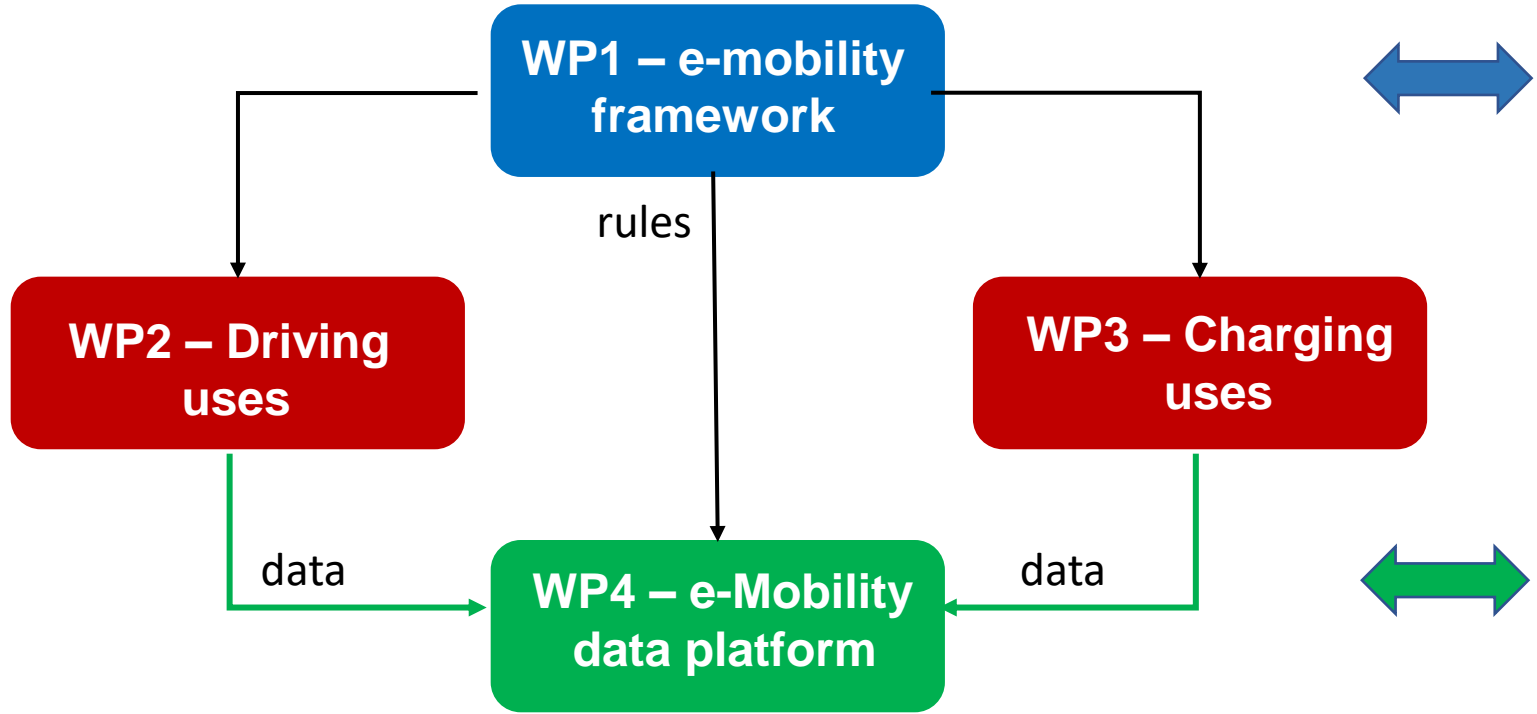
Axis -
Mobility
Data

Axis -
Tools for
Decision
making

Methodology layer

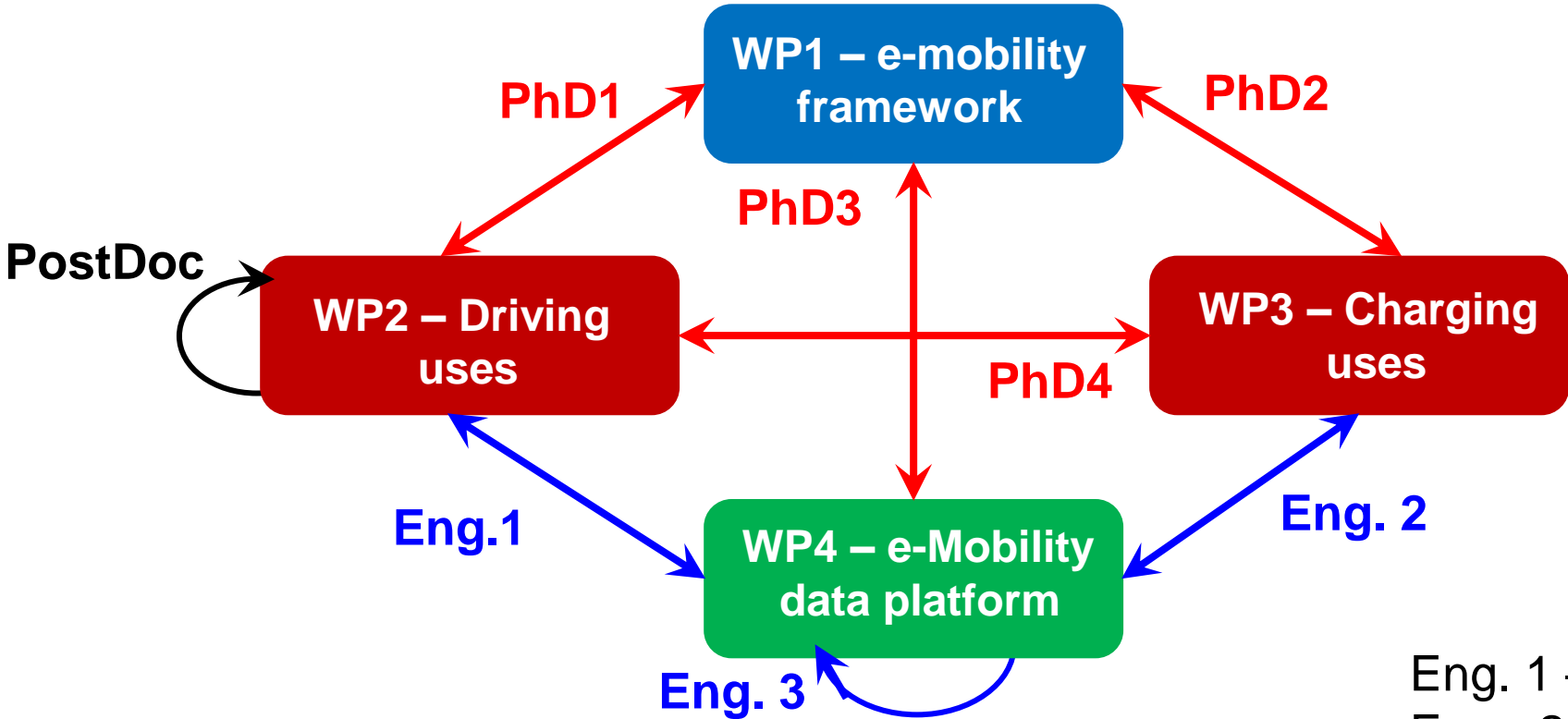
Application layer

Digital layer



Human resources

PhD1 – TVES – L2EP– Registration ULille
 PhD2 – ECO7 - MODIS – Reg UGE
 PhD3 – LIMOS – GERiCO (LIRIS) - Reg ESME
 PhD4 – TVES – ECO7 - Reg ULille
i.e. 2 CUMIN / 2 G4M and 2 ST / 2 SHS

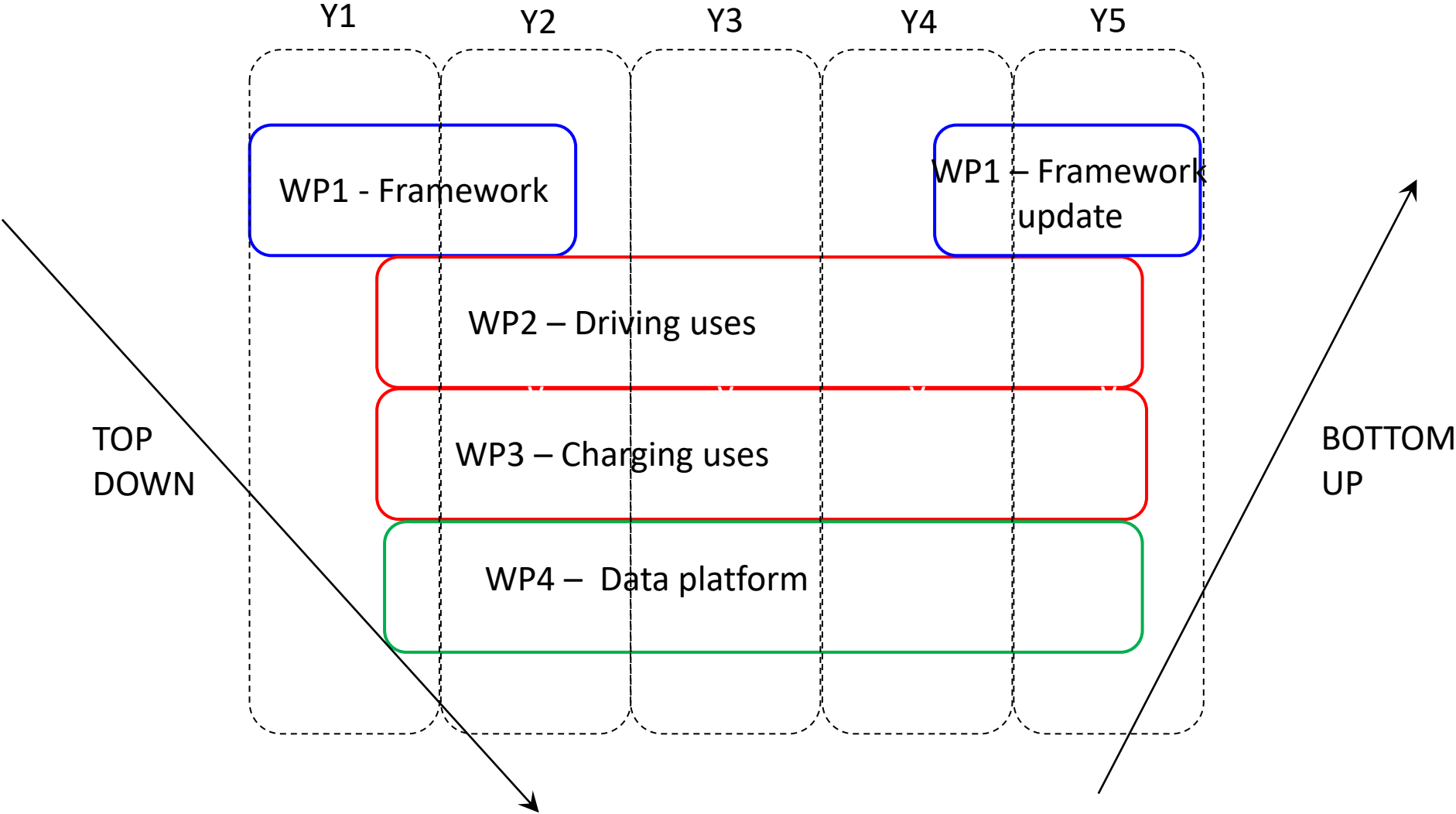


10 Master students

Eng. 1 – L2EP-TVES – Salary ULille
 Eng. 2 – ECO7 – LIRIS - Salary UGE
 Eng. 3 – LIRIS – LIMOS - Salary INSA

Post-Doc – L2EP - MEL

GANNT chart (overview)



Exemplarity of the project: carbon care action

How to have a neutral-carbon research project?

L2EP try to limit, estimate and compensate the GHG emissions of its conferences and projects



Exemple

PANDA - H2020 project (coordination, A. Bouscayrol, Univ. Lille, France) 2018-2022
on development of new simulation tools for e-vehicles



11 partners from
6 European countries



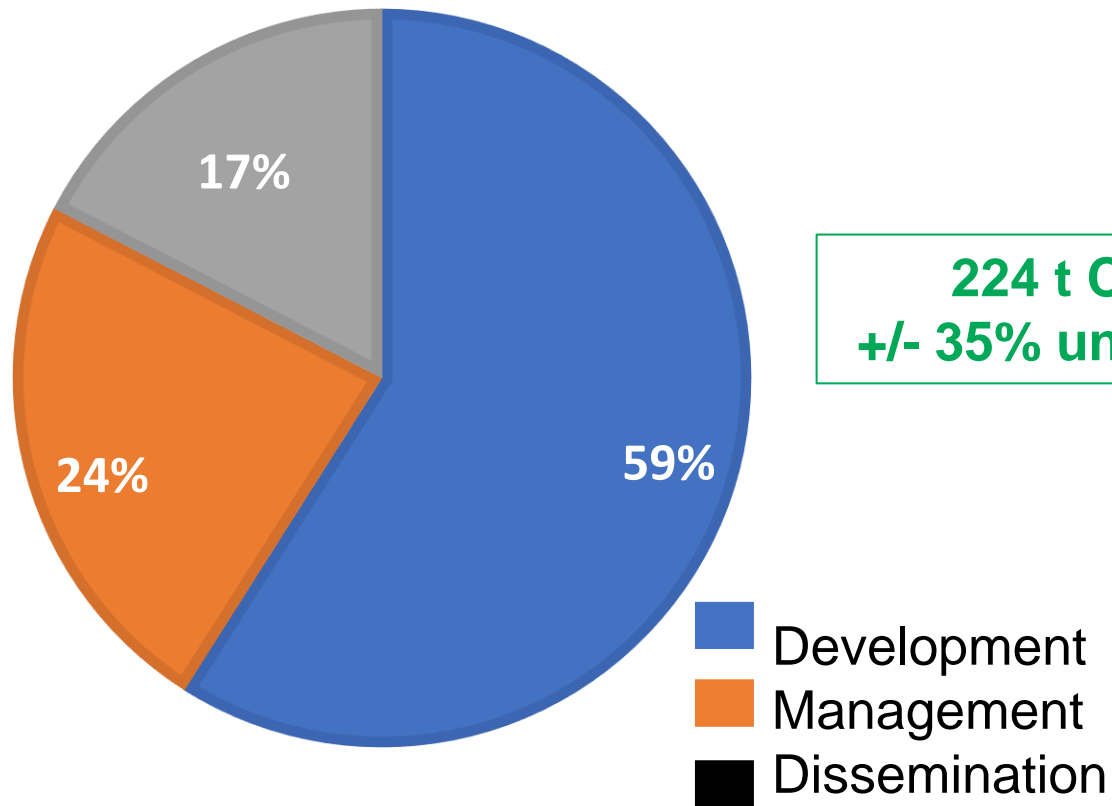
<https://project-panda.eu>

Example of GHG estimations



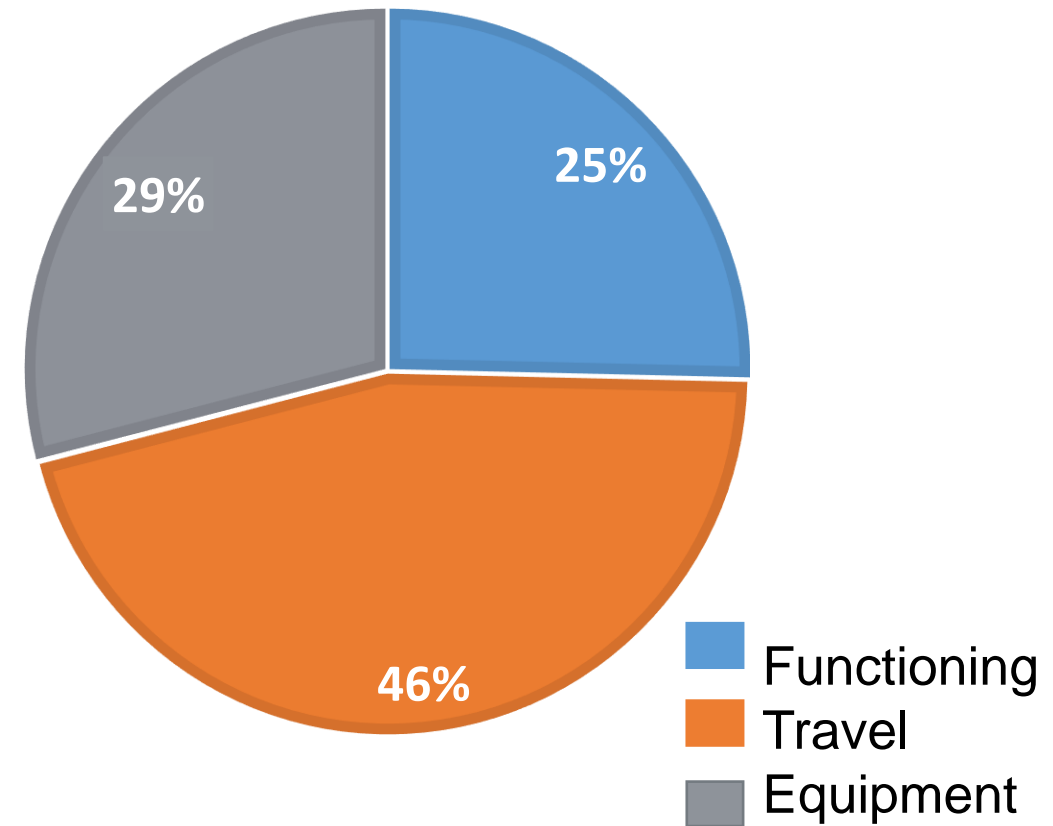
A carbon care team with **regular updates** to consider **all activities!**

PANDA GHG EMISSIONS



224 t CO₂eq
+/- 35% uncertainty

DISTRIBUTION 2019-2022

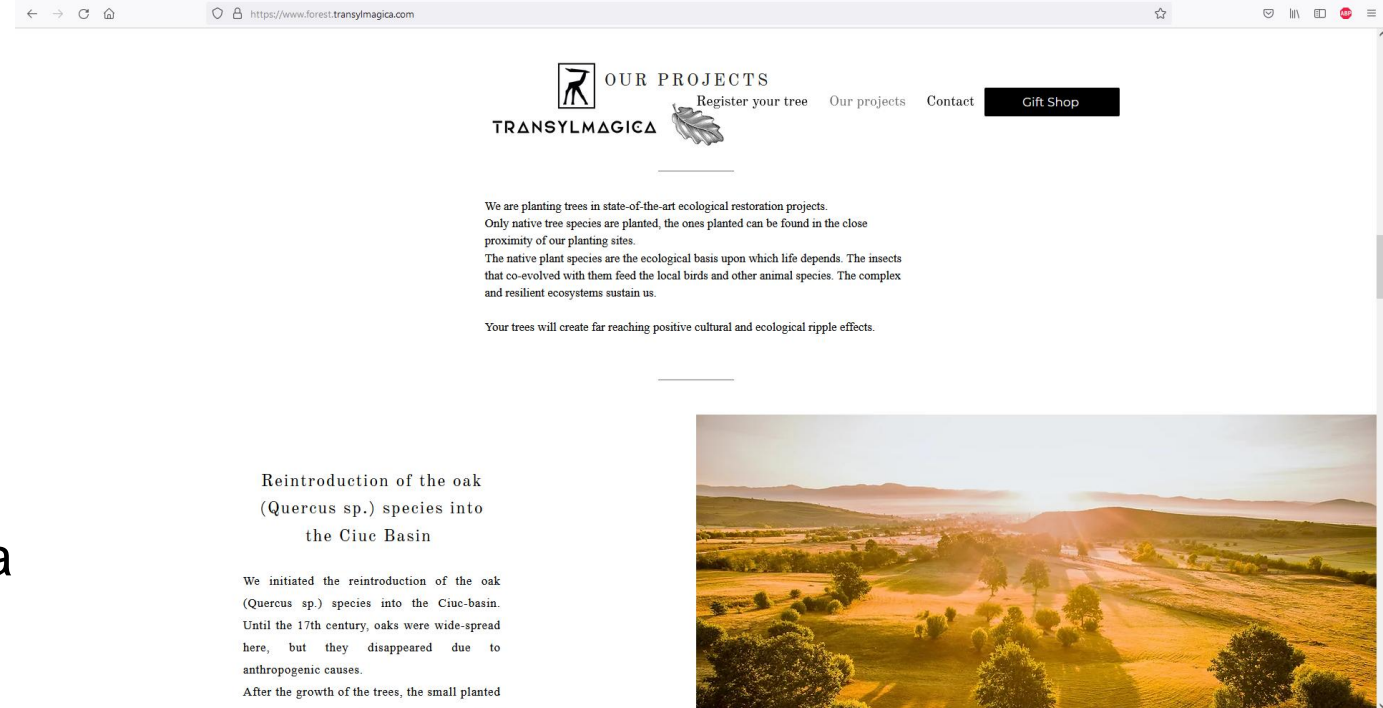


Example of GHG mitigation



- 🐼 A global action
- 🐼 A European project
- 🐼 Located in Romania
- (3 partners able to keep an eye on it)
- 🐼 Possibility to take part in planting camps

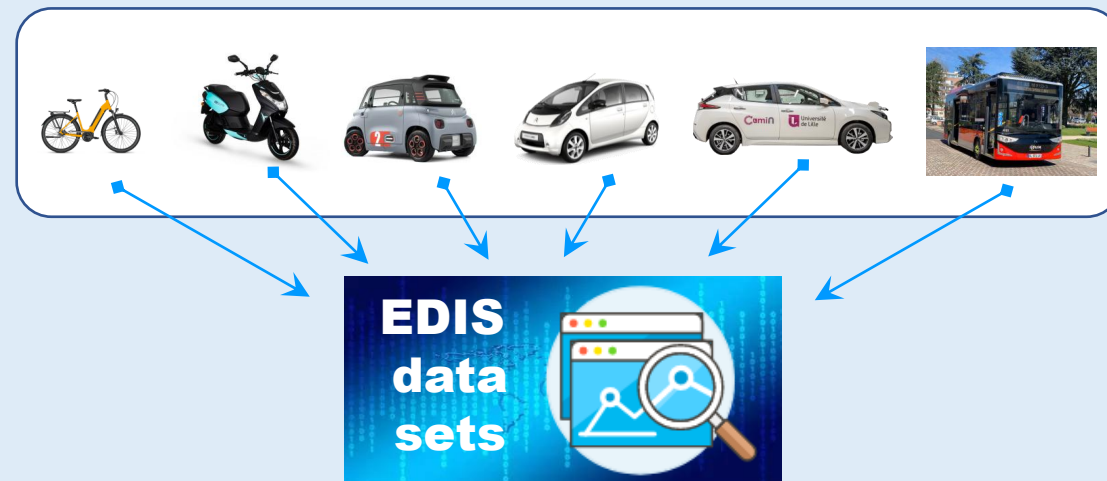
<https://www.forest.transylmagica.com/>



PANDA is a carbon neutral project!

Let's conduct a carbon care action for EDIS !

Thank you for your attention !



Ce travail a bénéficié d'une aide de l'Etat gérée par l'Agence Nationale de la recherche au titre de France 2030 portant la référence « ANR-24-PEMO-0002 »